

## Using PocketMax3

Part Number 874-0012-000 Released December 22, 2010



### App Note Contents:

1. PocketMax3 Utility .....	2
2. Differential Source .....	12
3. Other Functionality .....	20
4. Using Quick Config.....	27
5. Closing PocketMax3 .....	31

## ***1. PocketMax3 Utility***

PocketMax3 is a freely available utility designed for use with several Hemisphere GPS products:

- Crescent OEM
- Eclipse OEM
- Eclipse II OEM
- miniEclipse OEM
- Crescent Vector OEM
- Crescent Vector II OEM
- Crescent A100
- Crescent R100 Series
- Crescent XF100 Series
- Crescent V100 series
- Crescent VS100 series
- Eclipse A220 Series
- Eclipse R220
- Eclipse II R320

As this utility was not designed specifically for any one product alone, it supports features not offered by every product, however, the interface may be used for all I/O operations.

PocketMax3 runs on the Windows .NET framework, version 3.5 or later, allowing it to operate on several Windows platforms (Windows 2000, ME, XP, Vista, Seven, Mobile, etc).

This software offers you the following flexibility:

- Tune your beacon, WAAS, OmniSTAR and GLONASS receivers and monitor reception
- Configure GPS and GNSS message output and port settings
- Configure and monitor an RTK base station
- Configure and monitor Vector related settings
- Record various types of data

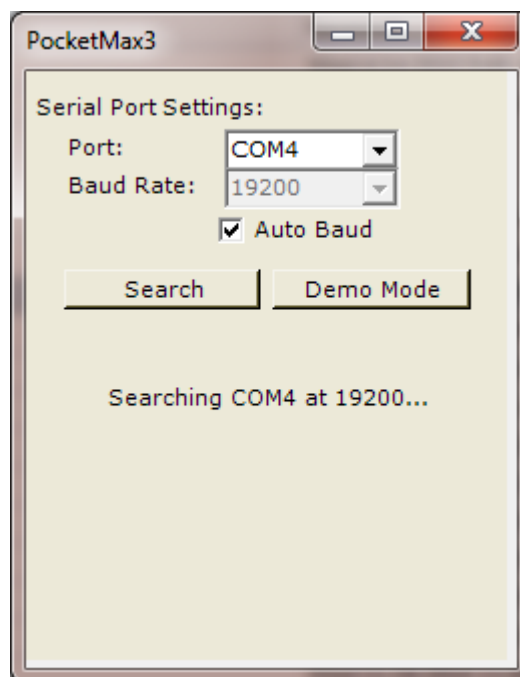
The most current version of PocketMax3 PC can be downloaded from the Hemisphere GPS website, or it can be made available to you by contacting Hemisphere GPS. Once you have saved the PocketMax3 executable to your computer, the program can be started by clicking on the file name or icon.

You will need to have the Windows .NET framework installed on your PC or mobile device. Follow the link for a PC install from the same webpage with the PocketMax3 download. Once you have the PocketMax3 executable appropriate for your mobile device's operating system, you can copy it over to your mobile device to whichever folder you wish. To start the program, navigate to the executable on your mobile device and tap the file.

### ***1.1 Connecting PocketMax3 to a Device***

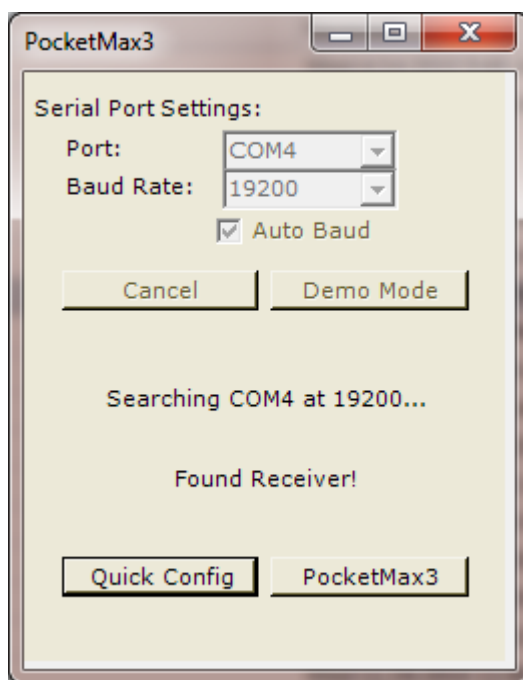
First power on the receiver and connect it to your computer's com port. A configuration screen will appear and you will be prompted to choose the COM port and baud rate of the receiver. You also have the option of allowing the program to cycle through all baud rates if you don't know your current communication settings (Auto-Baud feature). Another option you have at this point is to use the "Demo Mode" button. If you tap this button instead of the "Search" button, PocketMax3 will allow you to view all the different screens without being connected to a receiver. This mode may be useful to get comfortable with the program, or to demonstrate the software if you don't have a receiver available.

You can monitor your connection status through the icon at the lower right of the screen. If the two cables are shown as connected, then your computer has a valid connection with the receiver.



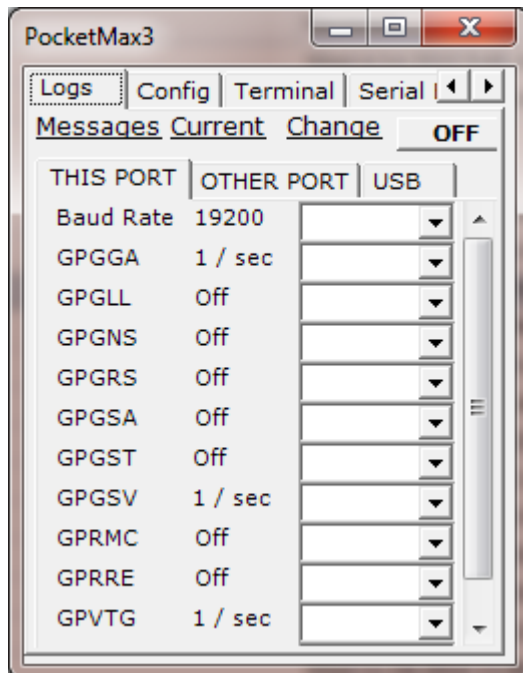
**Figure 1-1 Serial Port Settings Screen**

If you are properly connected, the Status window will display a “Found Receiver” message.



**Figure 1-2 Connection Established Screen**

The Quick Configuration screen allows you to use the “Log”, “Config”, “Terminal”, “Serial Bridge” and “About” tabs. For further explanation, see Section 4 Using Quick Config.



**Figure 1-3 Quick Configuration Screen**

If you get a message “Receiver not found...” check your connections, your com port and your baud rate and try again.

## ***1.2 Using PocketMax3***

Once you have successfully connected PocketMax3 to your receiver, the screen will look similar to the buttons along the bottom of the window are the main menus and are used to switch screens within PocketMax3 PC. The primary menu buttons along the bottom are as follows:

- GPS (Global Positioning System information and settings),
- (correction mode tab) depends on selected mode:
  - SBAS (Space Based Augmentation System, which includes WAAS and EGNOS)
  - BEAC (Beacon)
  - LBAND (OmniSTAR)
  - THIS (port currently connected to PocketMax3)
  - OTHER (other port)
  - PORT (Port C)
  - RTK (L-Dif® rover or RTK rover)
  - AUTO (e-Dif®)
  - NONE (autonomous)
- TMNL (Terminal),
- LOGS (logging data to a file)
- (additional functions) depends on the receiver connected:
  - Base (L-Dif® base or RTK base)
  - HDG (Heading; appears when Vector receiver connected)

Within each of these menu buttons, there are tabs along the top, as shown in the figure 1-10.

These tabs allow you to navigate within the menu and vary in number and name depending on which main menu you are currently in. There indicator lights along the bottom of the screen, just above the menu buttons (four if you are using a Vector product).

- The first indicator light is either grey or green and indicates either your communications or your position fix status.
- The second light is either grey or green and indicates whether or not you are tracking GPS signals.
- The third light is either grey or green and it indicates whether or not you are successfully tracking your differential source.
- The fourth light is either grey or green and it indicates whether or not you are successfully tracking DGPS.
- If you are using a Vector product, then there will be a fifth light for Heading, which will be either grey or blue to indicate whether or not you have a valid heading.

### 1.2.1 GPS Menu

Within the GPS menu button, the tabs are: Position, Satellites, Setup, Precision, Plot, Link and About. The Position tab contains all the main position information, including latitude, longitude, elevated height, speed and precision, all with configurable formats. There is also other information in this tab, including the differential source.

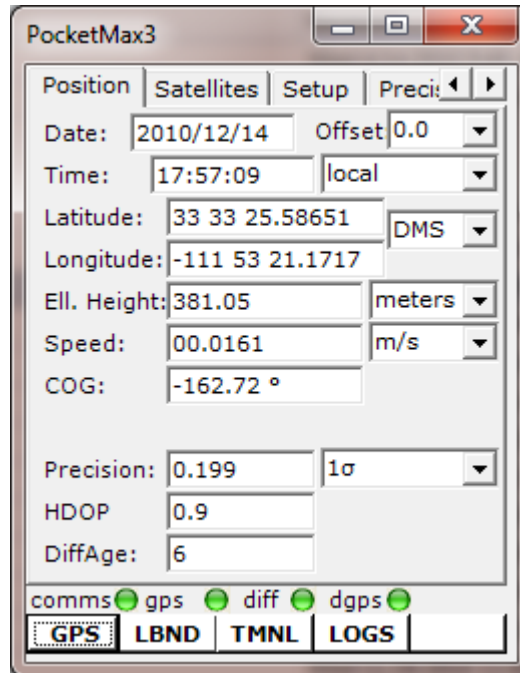


Figure 1-4 GPS Position Screen

**Note:** When the receiver is receiving GPS information from satellites, the fields Latitude, Lon, Date and Time in the GPS Position screen will all report current information. If these fields stop updating every few seconds, then you likely have a GPS or antenna problem.

The Satellite tab has a sky plot of viewable satellites, how many satellites the receiver is tracking, the PRN numbers of which satellites are being tracked and the bit error rate of the differential source. The receiver should be tracking at least 4 GPS satellites in order to compute a position, and ideally between 5 and 12 or more for best performance.

The GPS and GLONASS Satellite screen tabs show the signal levels and number of satellites being tracked, where applicable. The satellite signal strengths are represented by the bars: the higher the bar, the stronger the signal. Single frequency signals will be single blue bars (for example, all Crescent receivers, and all SBAS signals). Dual frequency signals will have split bars: the left side (blue) shows L1 signal strength, the right side (green) shows L2 signal strength.

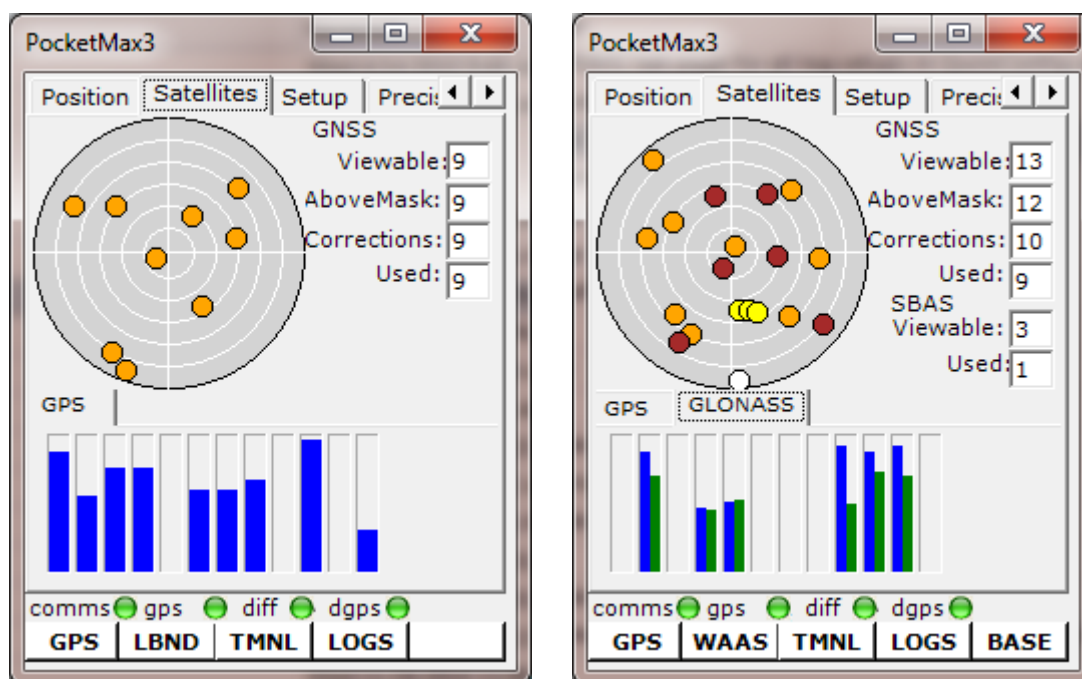
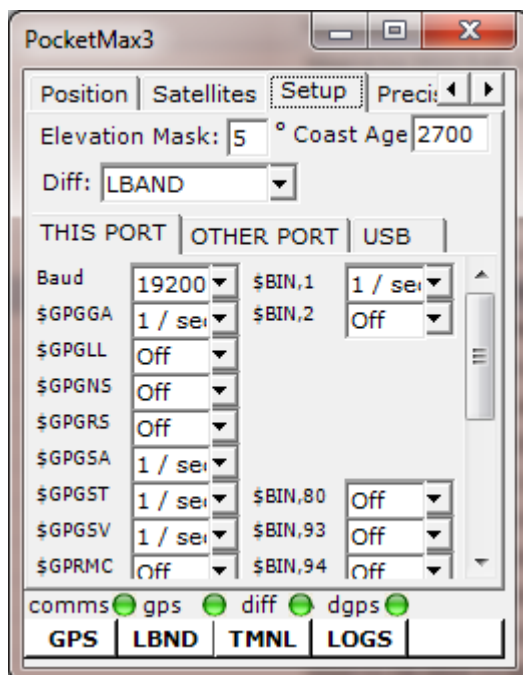


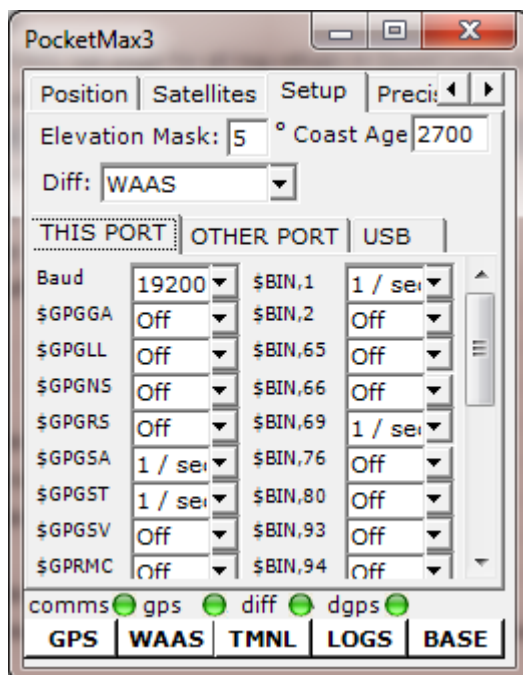
Figure 1-5 GPS Satellites Screen (L1 only), and GLONASS Satellites Screen (L1/L2)

The Setup tab allows you to change the configuration of the receiver including turning on and off NMEA messages, the elevation mask, the maximum COAST™ age and the baud rates.



**Figure 1-6 GPS Setup Screen**

The Setup tab contains three sub tabs, including “THIS PORT”, “OTHER PORT” and “USB”. These tabs allow you to adjust the messages (GGA, GLL, GNS . . .) being tracked on each port. In addition, you are able to adjust the BIN messages to custom fit your needs. (See Figures 1-7, 1-8, 1-9)



**Figure 1-7 This Port Menu**



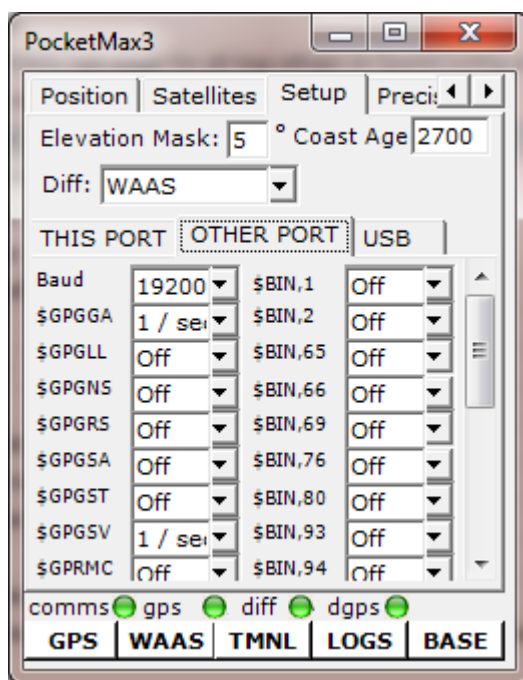


Figure 1-8 Other Port Menu

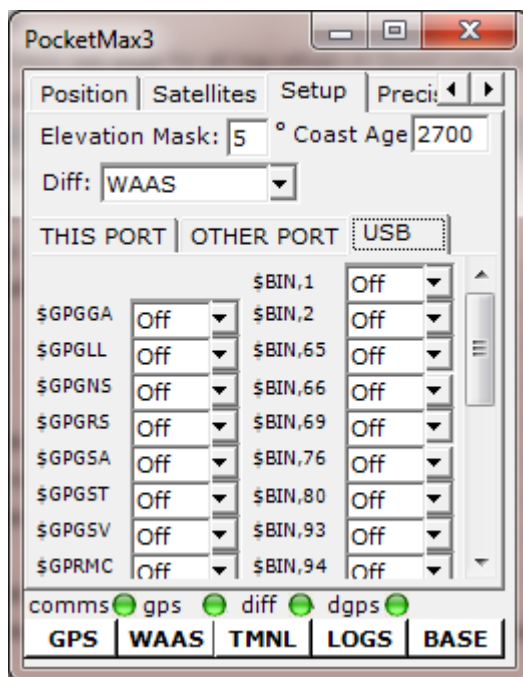
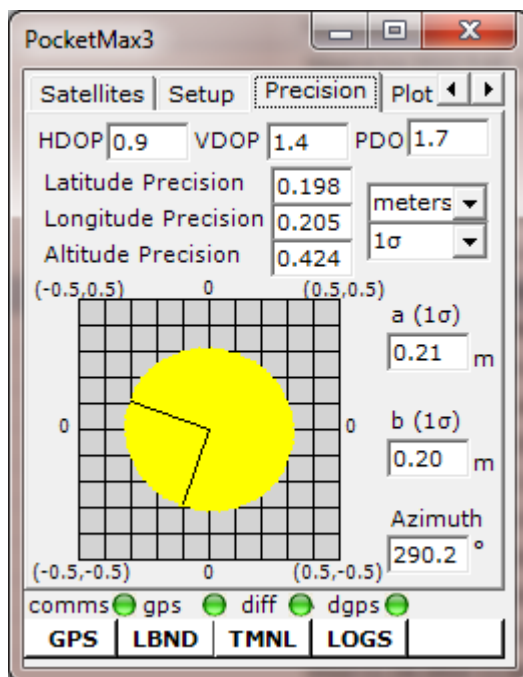


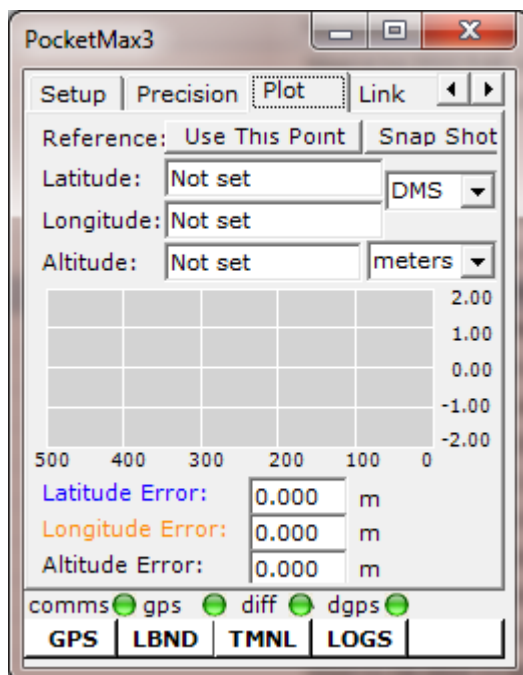
Figure 1-9 USB Menu

The Precision tab gives a graphical representation of horizontal accuracy in the form of an error ellipse. It also displays numerical precision in northing, easting, and altitude components in configurable formats.



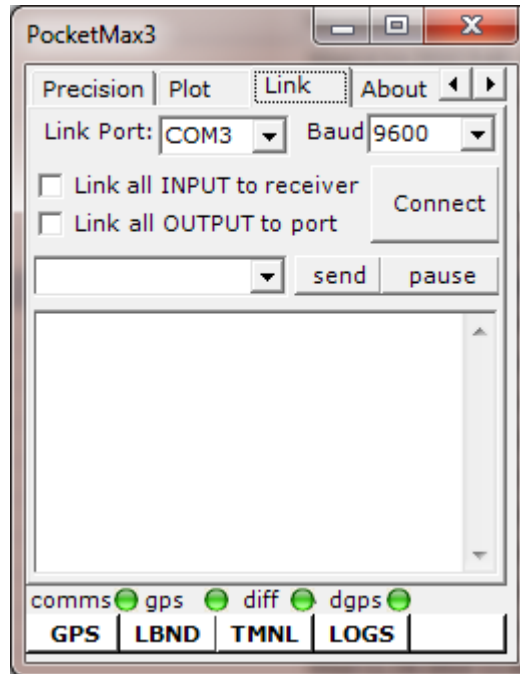
**Figure 1-10 GPS Precision Screen**

The Plot tab plots the northing or easting error over time and allows you to adjust your scale and timeline as required. This plot allows you to monitor performance over a time period with respect to either a known coordinate or an arbitrary one.



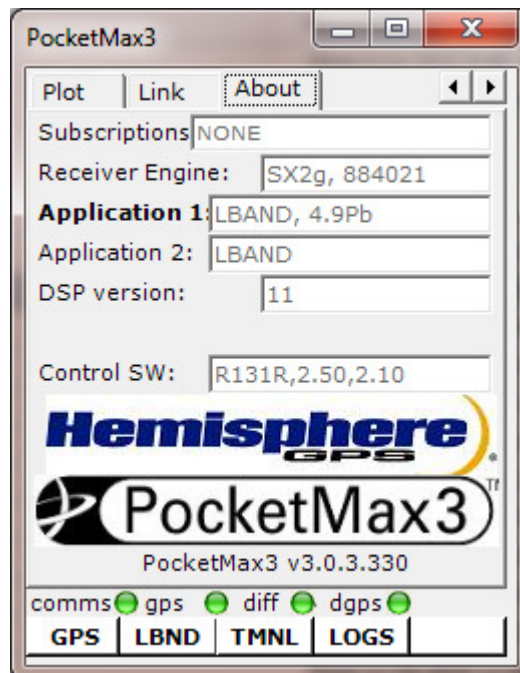
**Figure 1-11 GPS Plot Screen**

The Link tab allows you to connect a DGPS or RTK correction source to your computer, and have the corrections go into the GPS receiver via the same cable PocketMax3 is using. Define which PC communications port your correction source is connected to and its baud rate. It also allows you to send commands out of the additional ports, for example, to configure the correction device.



**Figure 1-12 GPS Link Screen**

The About tab displays the current firmware version and installed applications on the receiver.



**Figure 1-13 GPS About Screen**

## 2. Differential Source

The box at the bottom of the screen labeled Diff Mode within the GPS menu button, in the Position tab is where you can change differential sources. The other place you can change the differential mode is in the menu for the differential source (either SBAS/BEAC/LBAND), in the Status tab. In either of these, you can switch between SBAS (WAAS/EGNOS) and Beacon (or OmniSTAR if applicable) just by tapping the circle beside the desired differential source. By switching the differential source, the menu along the bottom of the screen will automatically update to reflect the current configuration.

### 2.1.1 SBAS Menu

The Status tab provides details of the satellites being used for SBAS corrections. The PRN (satellite ID number), longitude, elevation and azimuth, and the bit error rate of the tracked satellites are displayed. The SBAS Bit Error Rate (BER) shows the quality of the SBAS data received from the satellite(s). BER values should stay below 150 to maintain differential lock. Ideally, this value will remain between 0 and 50.

The line graph displays the BER's for up to three SBAS satellites, however only one satellite is required to provide corrections.

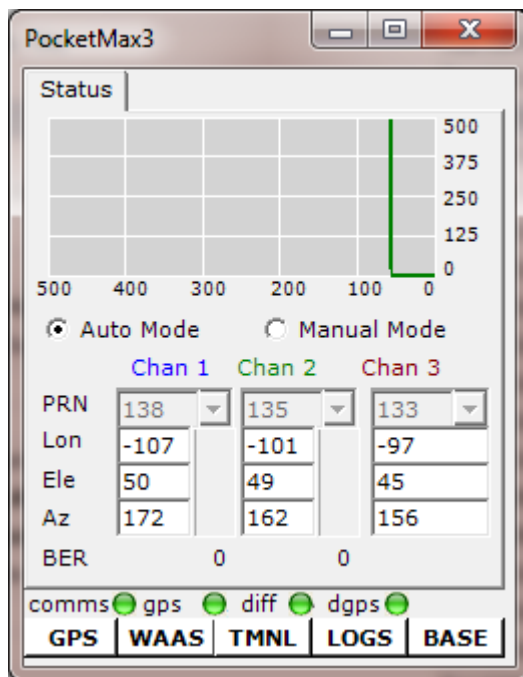
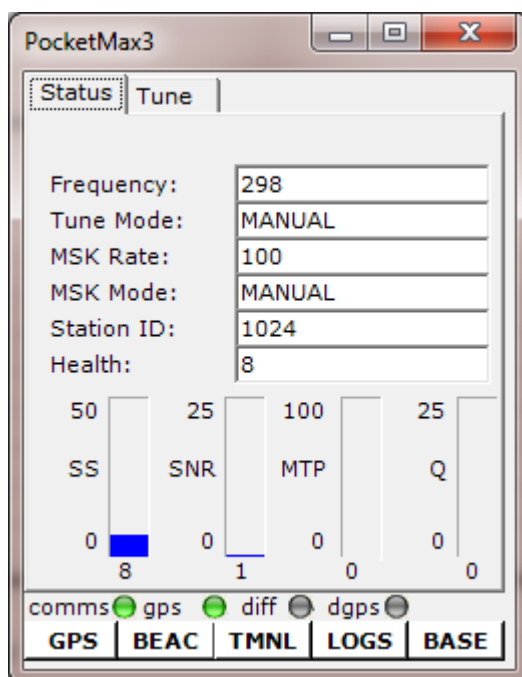


Figure 2-1 SBAS Status Screen

### 2.1.2 BEAC Menu

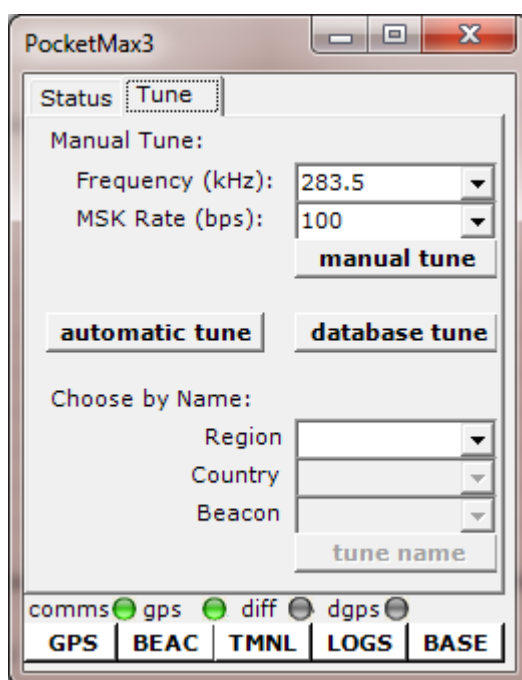
The tabs within the beacon menu button are Status and Tune. The Status tab provides details of the beacon station providing corrections, including the name (if available), the frequency and the

MSK rate, as well as the signal strength (SS) and signal-to-noise ratio (SNR) values. These values are also displayed graphically along with. Message Through Put (MTP) and Quality (Q).



**Figure 2-2 Beacon Status Screen**

The Tune tab gives you the option of automatically tuning to the strongest signal, specifying a specific frequency or MSK bit rate, or selecting a station by region. Once you have made your selections, you must press the adjacent 'Tune' button for the settings to take place.



**Figure 2-3 Beacon Tune Screen**

### 2.1.3 LBAND Menu

The tabs within the L-Band (OmniSTAR) menu button are Status, Tune and Subscription. The Status tab gives the name (if available), the frequency and the data rate of the L-Band satellite that is currently being used. It also gives the bit error rate, the satellite location and the status information.

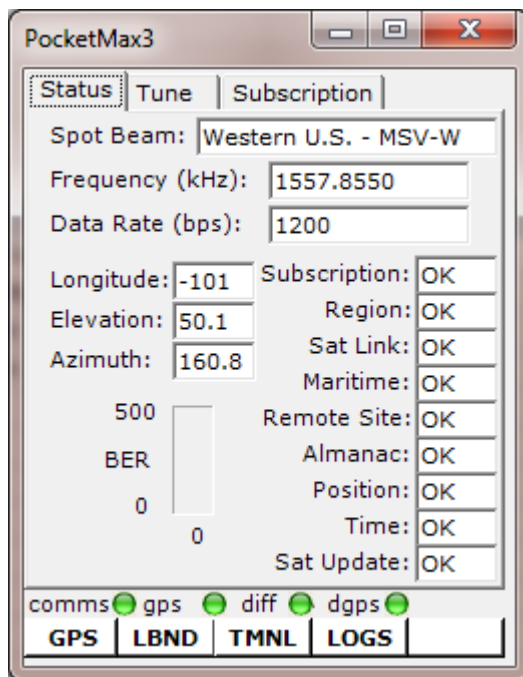
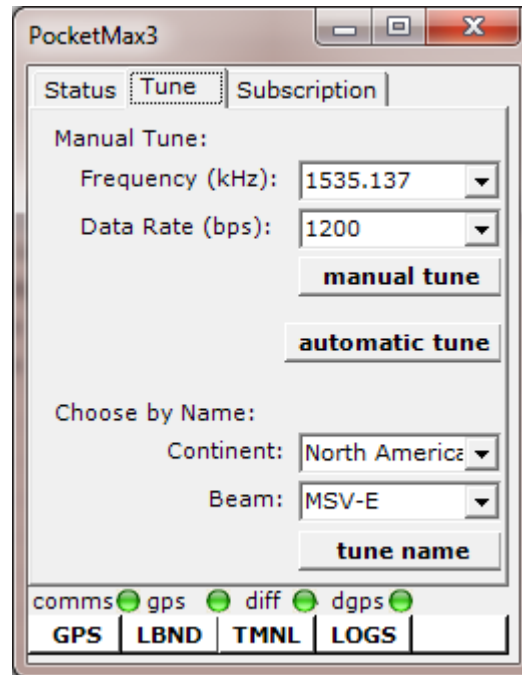


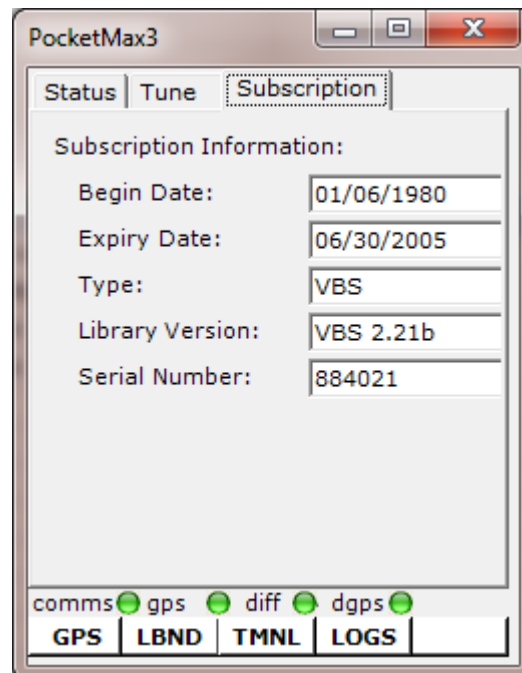
Figure 2-4 L-Band Status Screen

The Tune tab gives the name (if available), the frequency and the data rate of the L-Band satellite that is currently being used. It also gives the option of tuning manually by frequency and data rate, automatically or by the name of the satellite.



**Figure 2-5 L-Band Tune Screen**

The Subscription tab provides Begin and Expiry dates of the subscription as well as the Serial Number of the unit. The menu also provides the type of L-band program you are using, along with the current library being referenced.



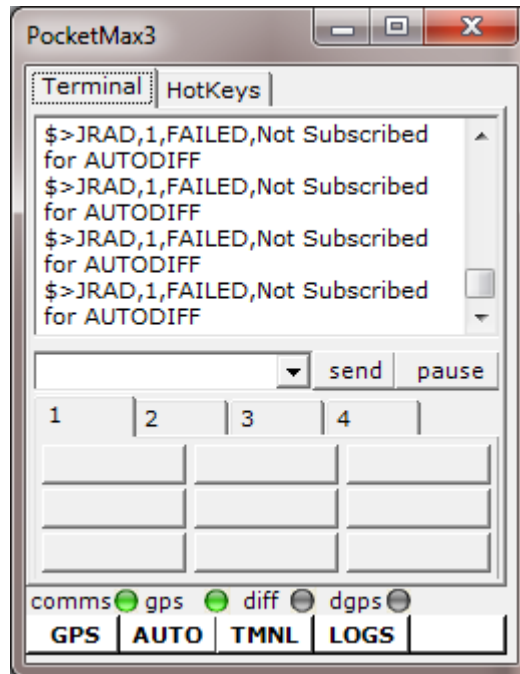
**Figure 2-6 L-Band Subscription Screen**

### 2.1.4 None option

The differential type selection NONE causes the receiver to operate without differential inputs, known as Autonomous mode. This option will not display a menu specific to the option, but will instead jump to the GPS/Position menu.

### 2.1.5 AUTO menu (e-Dif)

This single tab menu contains options to configure the receiver for e-Dif operation. An error will display in the TMNL window if e-Dif is not subscribed.



**Figure 2-7 e-Dif subscription error in TMNL**

The receiver can be subscribed using the terminal mode with commands described in the receiver's manual using codes supplied when the option is purchased. Contact your dealer or Hemisphere GPS' sales team for additional information on purchasing an e-Dif subscription.

For receivers with valid subscriptions (subscription will be shown in the TMNL window), this menu allows the user to initialize based on the multiple run, a known reference point, entered in the boxes labeled "Latitude," "Longitude," and "Height" to set the latitude, longitude, and height of a reference position or single run. Please refer to receiver user manual for more details on which option is appropriate to your application.



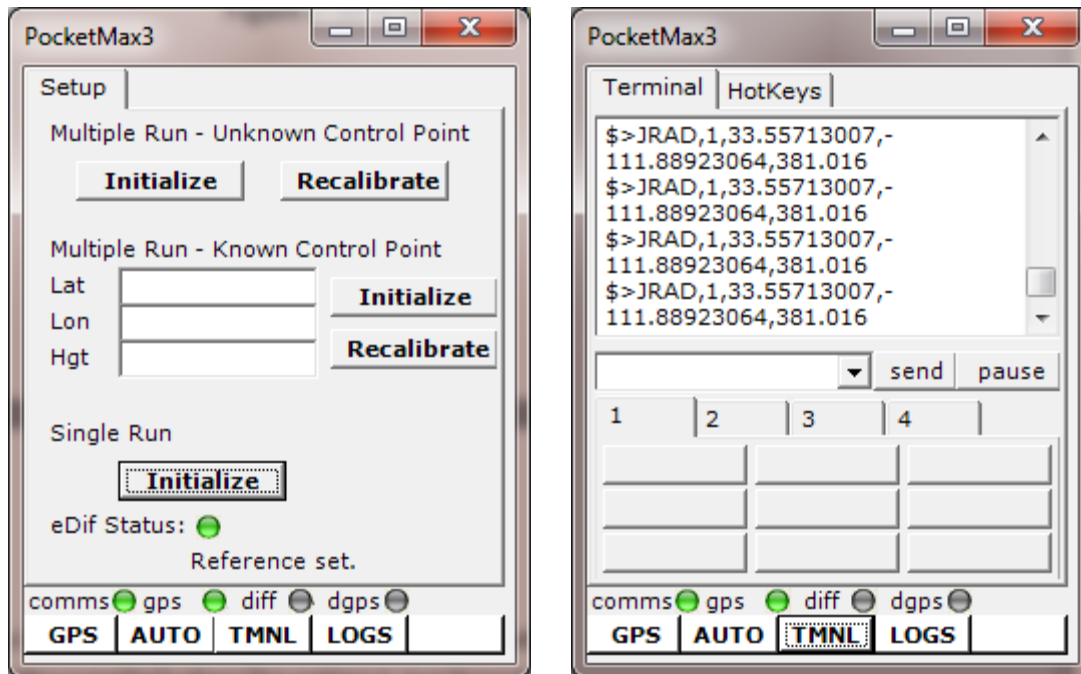


Figure 2-8 e-Dif menu, and VALID e-Dif in TMNL

### 2.1.6 THIS Port

The differential type selection THIS PORT causes the receiver to look for the differential inputs on THIS port. This option will not display a menu specific to the option, but will instead jump to the GPS/Position menu.

### 2.1.7 OTHER Port

The differential type selection OTHER PORT causes the receiver to look for the differential inputs on the OTHER port. This option will not display a menu specific to the option, but will instead jump to the GPS/Position menu.

### 2.1.8 PORT

The differential type selection PORT C causes the receiver to look for the differential inputs on Port C. This option will not display a menu specific to the option, but will instead jump to the GPS/Position menu.

### 2.1.9 Base Menu

This single tab menu contains options to set the Latitude, Longitude, and Ell. Height of a reference position and to select the port the receiver uses to connect to a radio that broadcasts local differential correctors. The reference position must be within five meters of the position estimated of the receiver. The settings may be sent to the receiver with the Initialization button that will highlight when the latitude, longitude, ell. height, and port are set to valid values.

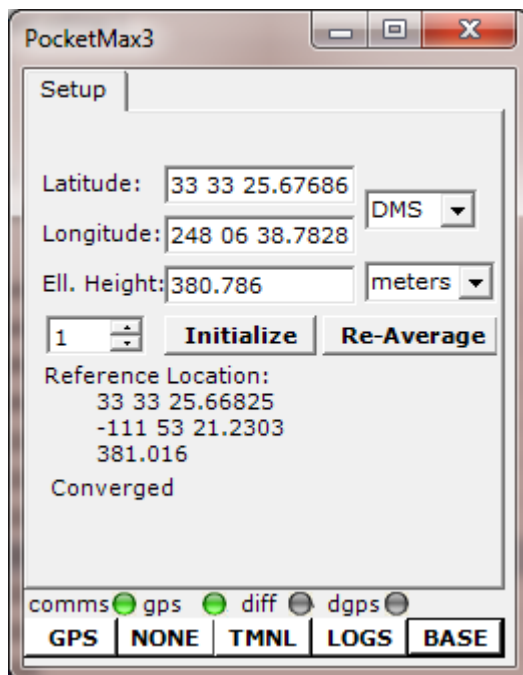
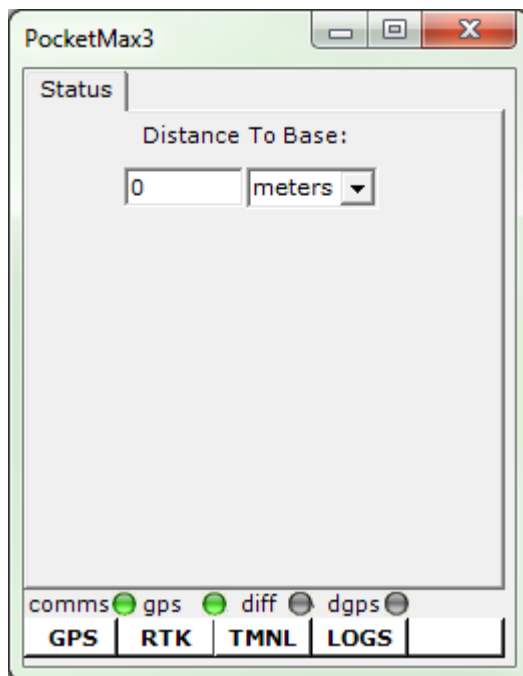


Figure 2-9 Base Menu

### ***2.1.10 Rover Menu***

This single tab menu contains no user parameters. Its purpose is simply to show that the receiver is configured as an RTK rover.



**Figure 2-10 Rover Menu**

### 3. Other Functionality

#### 3.1 The TMNL Menu Button

The tabs within the terminal menu button are Terminal and Hot Keys.

The Terminal tab gives you direct terminal access to the receiver for issuing commands and observing their response. The commands to communicate with the receiver are available in the Technical Reference Guide. Click once you have typed in the command and the response will appear in the window above. If you wish to re-enter a command you have previously entered, you may also select it from the dropdown menu.

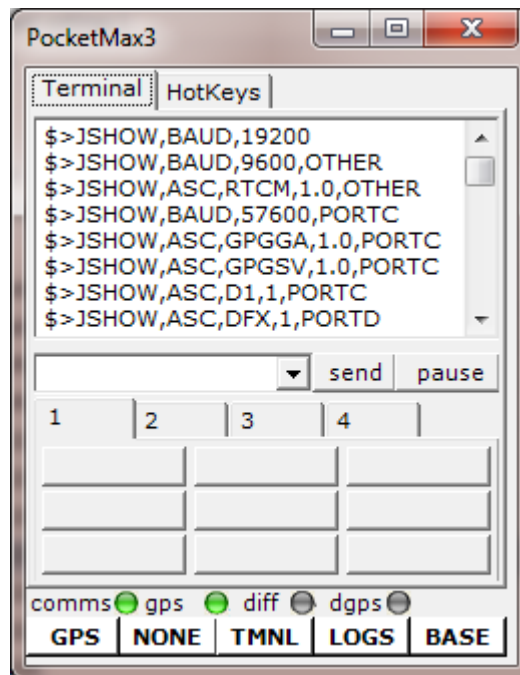
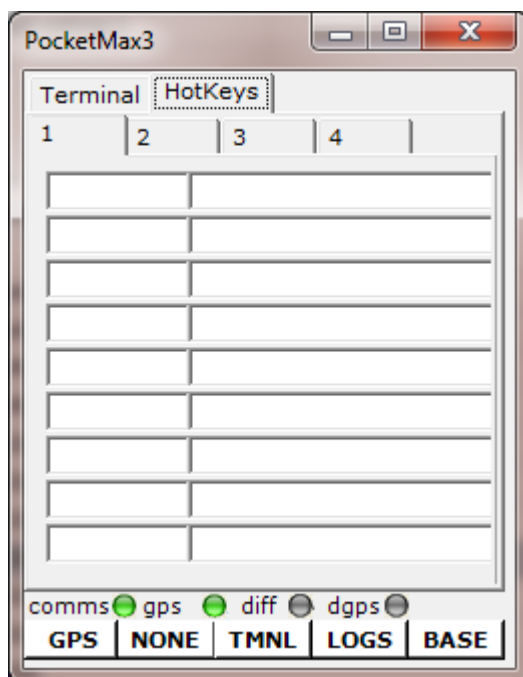


Figure 3-1 Terminal Screen

The Hot Keys tab allows you to set up frequently used commands, and assign them to the buttons displayed in the Terminal tab. The name of the key is entered in the left column, while the command is in the right column. There are 4 levels of hot keys, with 9 buttons each, for a total of 36 available buttons for programming.



**Figure 3-2 Terminal Hot Keys Screen**

### 3.2 The LOGS Menu Button

The tabs within the LOGS menu button are NMEA, Raw Data, Binary, Point and Polygon. Please refer to your receiver's manual for more information on each particular type of message that can be recorded. There are three options when logging: to Append to Existing File, Overwrite Existing File or to Create New File. When appending to or overwriting an existing file, you must select Browse to choose the appropriate file to modify. If writing a new file, the default file name of DYYMMDDx.txt is generated, specifying YY(year), MM(month), DD(day), x (numbers new files to differentiate between multiple files created on the same day). This may be overwritten with whatever name you wish to assign the file.

The NMEA tab allows you to setup NMEA messages to be logged. You can then browse for the location of the file and start recording data. When you have collected all of the data, press Stop to end recording.

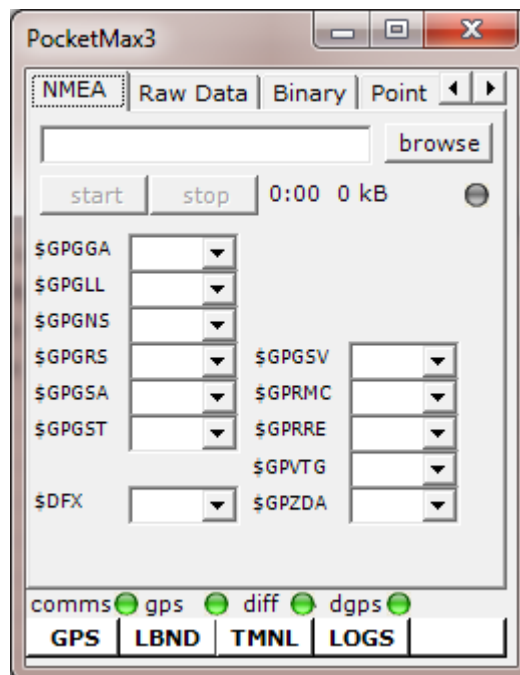
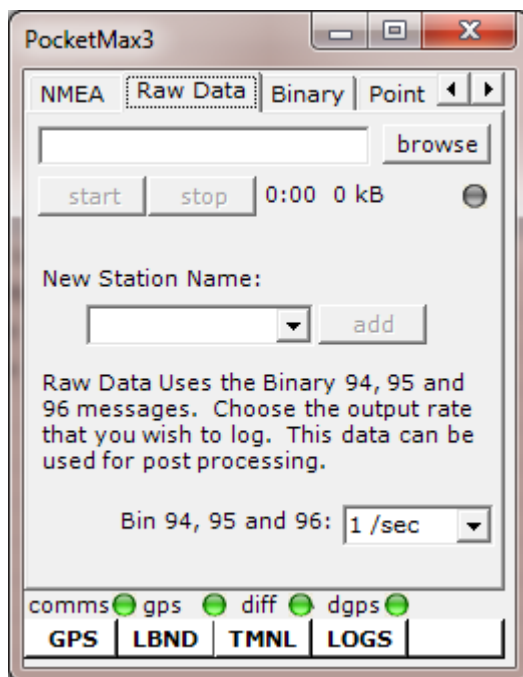


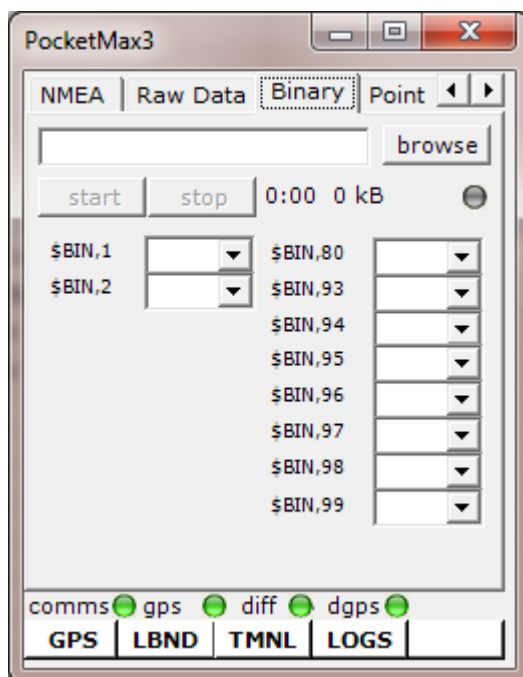
Figure 3-3 Logs NMEA Screen

The Raw Data tab allows you to log the raw binary messages needed for post-processing. The specific binary messages logged depend on the receiver connected to ensure the highest quality data is recorded.



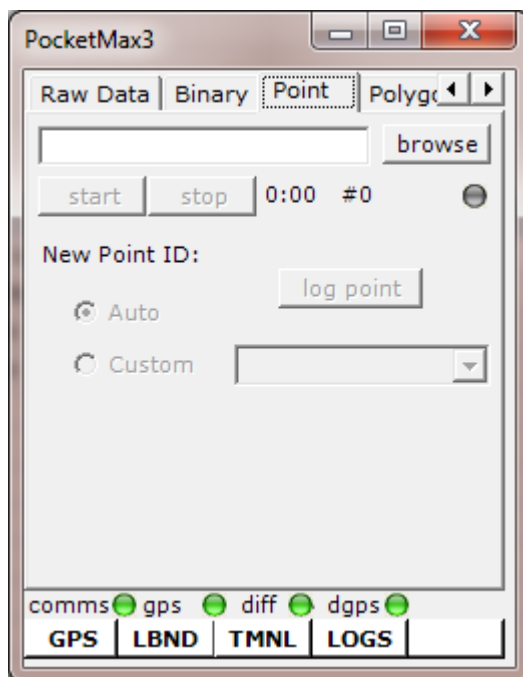
**Figure 3-4 Logs Raw Data Screen**

The Binary tab allows you to log a variety of binary messages.



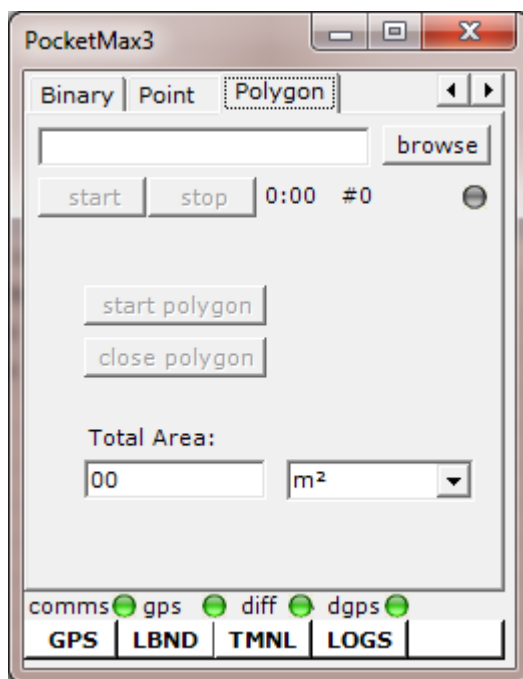
**Figure 3-5 Logs Binary Screen**

The points menu allows you to log a point each time the Log Point button is pressed. Point IDs may be assigned automatically or may be assigned custom names using the custom radio button and the edit box shown in the New Point ID group.



**Figure 3-6 Points Menu**

The polygon menu allows you to log polygons and displays the enclosed area. Click, “start” to begin. Click, “stop” to end.



**Figure 3-7 Polygon Menu**



### 3.3 The HDG Menu Button

The tabs within the HDG (heading) menu button are Status, Setup and Plot.

The Status tab gives you a graphical representation and numerical values for heading, rate of turn (ROT), course over ground (COG) and speed. By pressing GO, this is equivalent to issuing the \$JSEARCH command, and causes the receiver to reject its current RTK solution and re-compute heading.

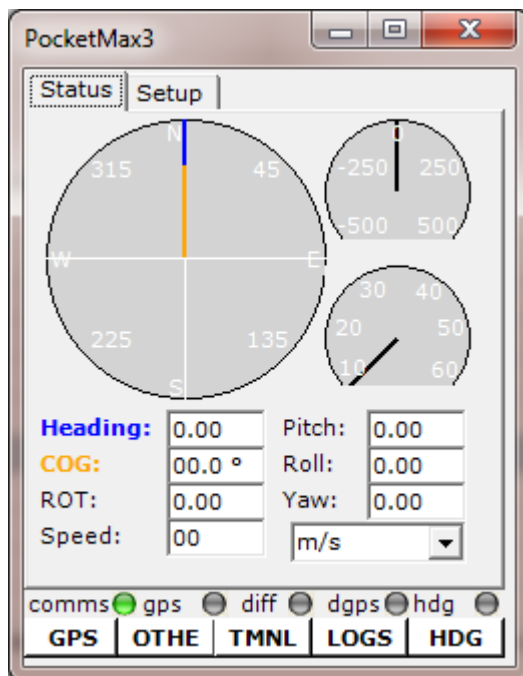
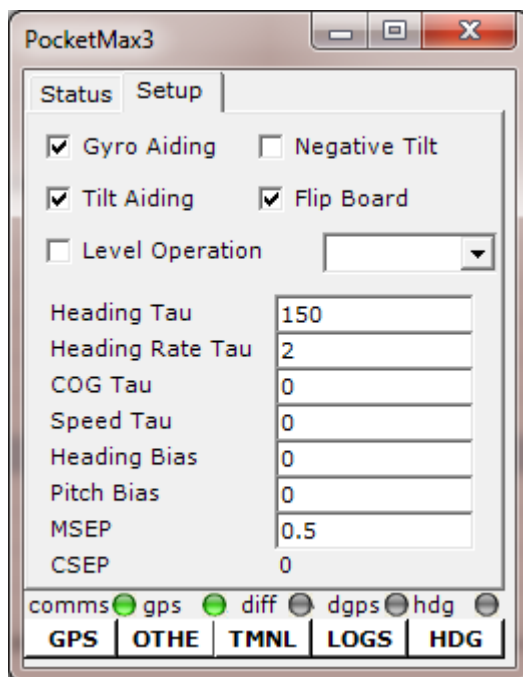


Figure 3-8 Heading Status Screen

The Setup tab shows you the current configuration that is unique to the Vector products and allows you to change this configuration.



**Figure 3-9 Heading Setup Screen**

## 4. Using Quick Config

Sometimes you may want to simply configure your GPS receiver to output some specific messages, then save that configuration so you can use your Hemisphere GPS receiver with someone else's software. With the numerous screens and features in PocketMax3, it can be a little confusing how to simply configure the output. In such cases, use the QUICK CONFIG option to simplify your workflow.

While in Quick Config mode, PocketMax3 will only request messages and define parameters that you specify for the receiver. This is different than the full PocketMax3 mode, which requests messages it needs in order to populate the graphical displays etc. with information from the receiver. When in Quick Config mode, you will not be able to monitor the signal tracking or receiver performance.

### 4.1 Quick Config Options

Quick Config allows access to five tabs: "Logs", "Config", "Terminal", "Serial Bridge" and "About".

Use the LOGS tab to define which messages to send from the various receiver ports.

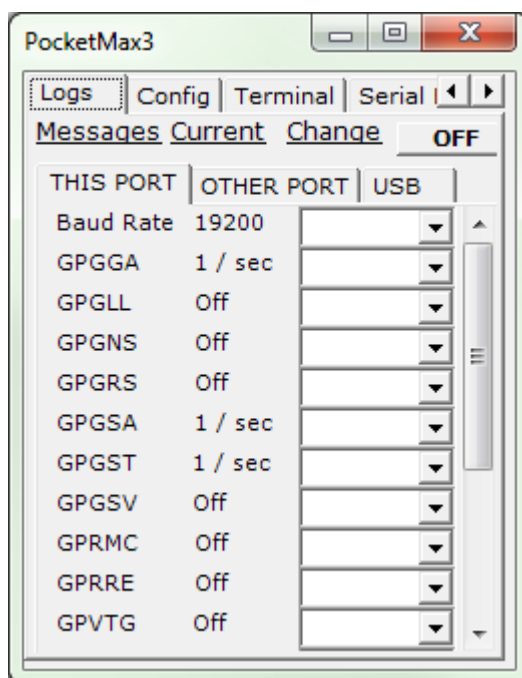
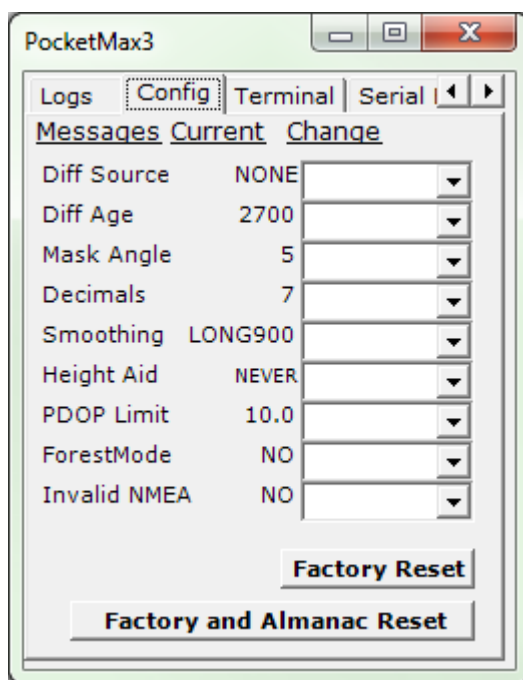


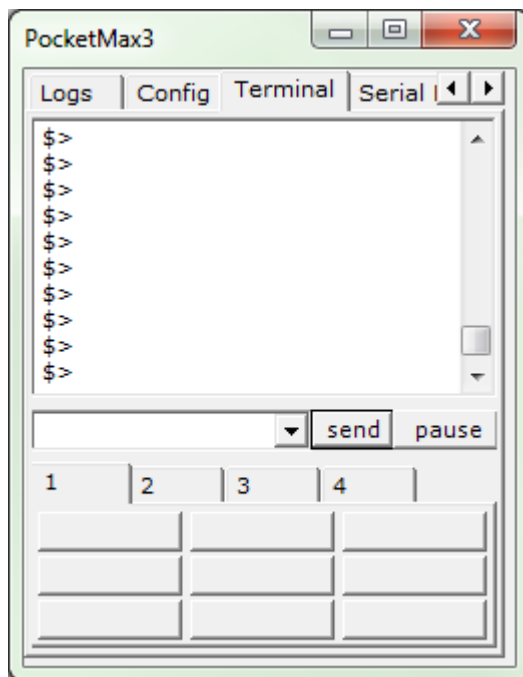
Figure 4-1 Quick Config Logs Menu

Use the CONFIG tab to set parameters like mask angle and your correction source.



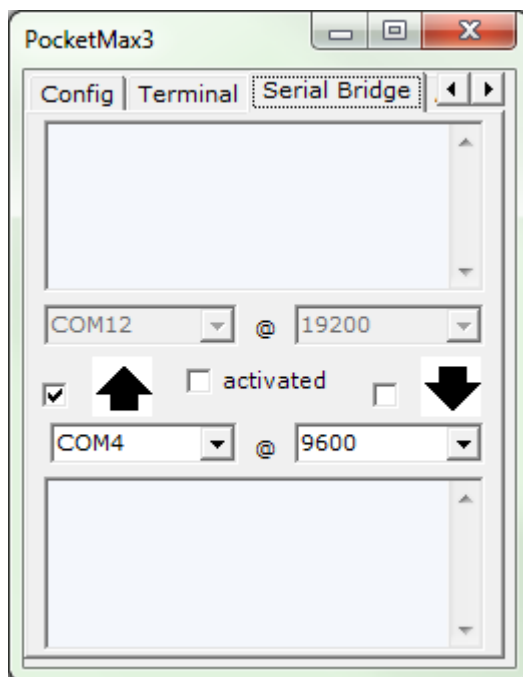
**Figure 4-2 Quick Config Menu**

Use the TERMINAL window allows you to see the messages coming through on the port you are currently connected to. You can use this tab to verify that only the messages you want are being sent.



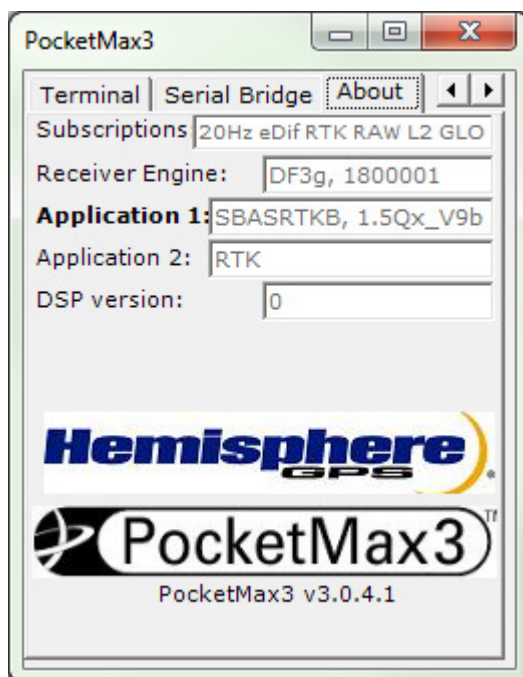
**Figure 4-3 Quick Config Terminal Menu**

The Serial Bridge tab creates a link between an additional communications port on your PC and the receiver. This function is a special mode that is not part of typical operation, and should typically only be used under the direction of Hemisphere GPS Technical Support staff.



**Figure 4-4 Quick Config Serial Bridge Menu**

The About tab displays the current firmware version and installed applications on the receiver.



**Figure 4-5 Quick Config About Menu**

## ***4.2 Exiting Quick Config***

Now that you have configured your receiver to output the messages your other software needs, click the X in the upper right corner to exit.

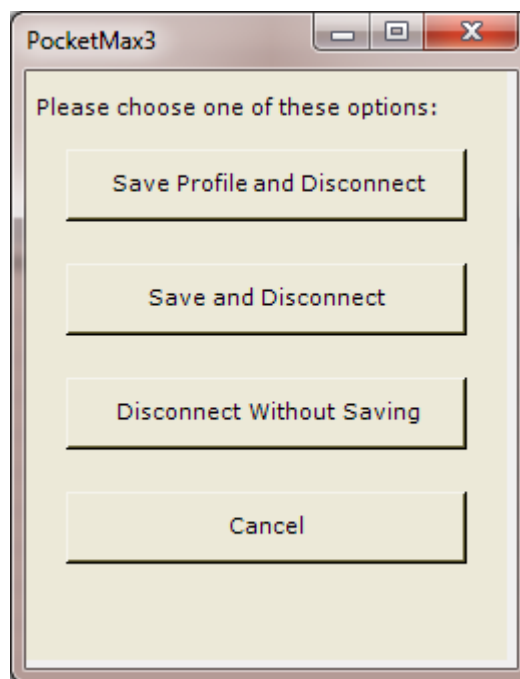
You will most likely want to click the "Save and Disconnect" button. This will ensure the settings you just entered will take effect every time your receiver is powered on.

If you do NOT want to save the way you just configured your receiver, select one of the other options.

For more information on closing PocketMax3 see Section 5 Closing PocketMax3.

### ***5. Closing PocketMax3***

The process of closing PocketMax3 is critical in the proper configuration of your receiver. It is very important to let PocketMax3 fully close in order to allow it to first configure your receiver and secondly display a report of the new configuration before exit. When you tap on the 'X' in the upper right hand corner of the program to exit, the following screen will appear.



**Figure 5-1 Exit Screen**

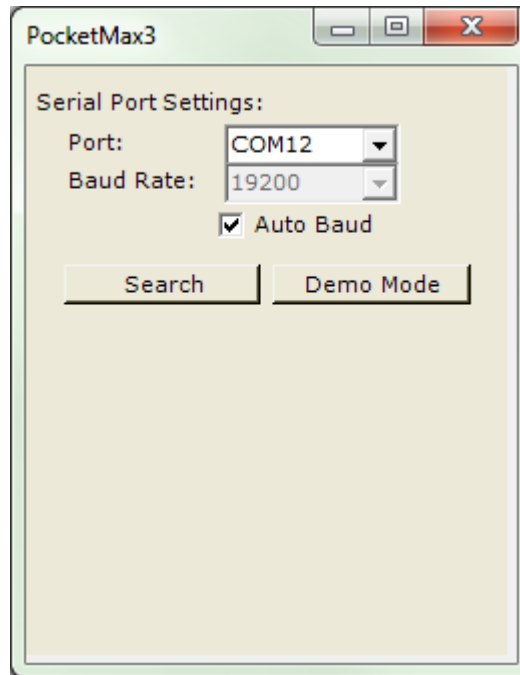
Save Profile and Disconnect saves a profile with your selected settings to a receiver configuration file, then saves the configuration to the receiver's flash memory, then exits the program.

Save and Disconnect will close the program and save any configuration changes you have made to the receiver's flash memory.

Click Disconnect Without Saving if you do not wish to save your modifications to the receiver's flash memory. PocketMax3 will exit without saving.

Click Cancel if you wish to return to using PocketMax3.

After you have made your selection, you will see the screen below. Click the X in the upper right corner to close, or you can search for the receiver again if you like.



**Figure 5-2 Closing Screen**

---

**Caution – You may lose settings that you have configured using PocketMax3, if you disconnect or power down your receiver while PocketMax3 is still running.**

**Be sure to let it close completely before powering anything off.**

---

### ***FURTHER INFORMATION:***

The Precision Products Tech Support team in Scottsdale has coordinated defining the Workflow documentation procedures and templates. Please contact them for further information.

This document is provided for technical support purposes only. Please refer to the product documentation for warranty, license and safety information associated with the product.